25X1

THE FOREST AND WOOD ECONOMY

Introduction

25X1

This is UNEVALUATED Information

1. From ancient times, forestry has been second in importance only to agriculture in the economy of Lithuania. Wood is used very extensively. In 1939, 91% of all Lithuanian buildings were of wood. In spite of this high percentage, however, 70% of all wood produced was used as fuel. (The production of peat, reserves of which are estimated to be sufficient for 100 years, has always been inadequate, and the country does not have reserves of either coal or oil.) The low standard of living in Lithuania is partly responsible for the great use of wood. The country simply has not been able to afford such expensive substitutes for wood as oil, coal and iron, and there is no indication that the situation will change in the future.

2. Lithuanian boundaries have often changed and many governments and occupying forces have instituted new forms of administration and legislation. The basic territory of Lithuania, as considered here, is that which was under Lithuanian sovereignty from 1918-1939. In dealing with the meager and primitive historical statistics for the area, difficulties were encountered because of the boundary changes. Sometimes application of the available statistics was impossible.

3. Another item of difficulty in studying the area was occasioned by the confusing mass of topographic terms. Until 1918, these were of Slavic or German origin and differed sharply from the Lithuanian terms. In the material which follows, both terms are given originally to ensure clarity but the preferred term is that of the area in question (e.g. Lithuanian names in Lithuania, Polish in Poland, etc.).

4. Source materials on Lithuanian forestry including wood production and utilization, are usually organized according to political and economic eras. The divisions of Part II are, therefore, organized in like manner as follows:

Chapter I - The Czarist Occupation, 1795-1915

Chapter II - The Imperial German Occupation, 1915-1918

Chapter III - Independent Lithuania, 1918-1939

Chapter IV - Lithuania, 1939-1940

Chapter V - The Soviet Occupation, 1940-41

Chapter VI - The Nazi Occupation, 1941-44

Chapter VII - The Second Soviet Occupation, 1944-

CHAPTER I - THE CZARIST OCCUPATION, 1795-1915

A. The Succession of the Polish Kingdom

1. The Polish Kingdom of 1795

(a) The United Polish Kingdom (which included the Grand Duchy of Lithuania) was a republic with an elected monarch who held office for life. The ruling class, composed of the gentry and clergy, jealously guarded its special privileges against the monarchist tendencies of the King. Tension between the King and this powerful class weakened the resistance of the state to outside forces. Agricultural and forested lands were owned by the members of the two opposing sides, and serfs bound to the land provided the labor force.

(b) Under the Kingdom, the economy of the area suffered. By 1795, the transition from a barter to a money transaction had just been realized to a point where the latter was supreme; industry had not developed; and the foreign trade balance was negative (the Kingdom exported grain, cattle, cattle products, timber, and forest products).

(c) The Kingdom was partitioned in 1795 by Austria, Prussia, and Russia. The northern portion of the area, including Lithuania, became a province of Russia. The value of the Polish monetary unit, the zloty, was set at 20 Russian kopeks, and Russian measurements were introduced.

2. Forest Property Relationships Under the Czars - Common Rights

(a) The property right was hereditary and absolute. It could be revoked only for treason. All forests were under royal ownership or were the property of the clergy or landlords. The royal forests took two forms:

(1) Large tracts lying between former tribal areas which had been "no-man's lands". They were generally swampy watersheds and were used mainly for hunting. They were called "Pushchas";

(2) Smaller tracts within the boundaries of the royal estates. They served two purposes: To provide timber and fuel for the royal owner's use; and for the use of the local peasant population as partial compensation for its labor. The forests owned by the clergy and landlords were small ranges within their estates and were managed by them for their own uses.

(b) The best managed forest areas were those in the first category of the royal forests, the "Pushchas". Lithuanian silviculture had its beginnings in these forests, where early progress was made toward establishing laws, regulations, and proper protection and basic management programs. The second category of royal forests was managed very poorly. The worst of these areas were those used by the peasants [see end of report for availability of a photograph of a typical northern alder forest exploited by peasants].

(c) Royal forests made up about 20% of the total area of forest land. The landlords and clergy owned the remaining 80% of these areas. When the lands of the clergy were seized by the state, the forests were combined with the royal forests and all became Russian state forests. A special category, "Crown Forests", was established. The revenues from this group were used to maintain the royal family. The woodlands and small forests used by the peasants included large areas and in the Kaunas government area included an area of 1/12 (8%) of all the land owned by the government.

3. Forest Property Relationships Under the Czars - The Right of Entry

(a) The right of entry, i.e. the right of the serf to enter upon and use the property of the titled land owners, was voluntarily created by the land owners in order to attract labor. The peasant population, decimated by war and pestilence, was sometimes insufficient to fill the needs for labor. The right of entry was designed to keep the serf on the estate and to attract serfs from other areas where the right had not been granted or was less generous. The right of entry included at one time or another the right to use timber for structural or fuel purposes, to graze livestock, to exploit and maintain bees in hollow trees or hives, to cut hay, and to fish. It was hereditary and once granted for an area could not be revoked.

(b) The grant of the right of entry originally harmed the land owners very little since the forests had no value and the peasant population was very small. As populations increased and timber grew in value, however, the right of entry became a serious burden to the land owners. In many cases it led to the complete deforestation of forest areas. The royal forest administrators were first to recognize the danger of this situation. As early as 1557 the problem served to stimulate the land reform programs of King Zygmunt II.

(c) As a result of Zygmunt's reforms, the royal forests were surveyed, their boundaries were marked, and entry rights were exchanged for land. In 1795, the right of entry to hunting estates had already been exchanged for land, but forests on royal agricultural lands were still open for woodcutting and grazing. The right of the peasant to access to this land and to the land of the clergy and land owners was never taken away.

4. Forest Distribution

(a) The royal forests were small in the areas of oldest settlement in Lithuania (the counties of Trakai, Vilno, and Ukmerge, and the area around Telsiai). Typical farm estate royal forests still exist in the forestry districts of Ziesmariai, Daugu, Kaisiadoriu, Utenos, and Labanoro. The hunting forests were located in the eastern portion of Lithuania. Remains of these forests exist in the districts of Veiseju, Ziesmariai, Kazlu-Rudos, Jures, Lekeciu, Sakiu, Panemunes, and Prienu. Large areas of the royal forests were located in northern Lithuania around Swienciany.

(b) The forest estates of the landlords and clergy were to be found mainly in western and northern Lithuania. Largest concentration of these lay along the Russian border in the countries of Taurage, Raseiniai, and Ukmerge, Panevezys, and Birzai. The forests and woodlands used by the peasants were distributed throughout the country.

(c) In 1795, most of the land had been surveyed, the farm lands located in compact areas around the villages divided into three fields and each field was sub-divided into as many strips as there were farm (family) units (voloki). These strips were further sub-divided as it became necessary to pass property on to heirs. In addition to these family-held farm units, each village held a common area including pasture, moor, and sometimes forest. Such areas were in existence even until 1935 when they were divided into individual farmsteads.

5. Forest Size

(a) As of 1795, the eventual limits and size of Lithuanian forests had not been determined. The process of the conversion of forest land to agriculture was still going on. In particular, the forests used by the peasants were affected, since the practice was then common of cutting down a forest, using the area for agriculture, and then abandoning it. The abandoned areas reforested with trees of a quality suitable only for fuel and to a density of only 40-50% (according to the estimate of Prof P Matulionis).(1)

(b) As a result of historical practice, the Lithuanian forests of today primarily occupy areas unsuitable for agriculture.(2) Under Czarist rule, Lithuania was a land of small to large forest areas separated by agricultural areas and meadows. The forest area was steadily growing smaller, but was still abundant. Highly valuable timber remained in the properly managed areas, but those under peasant control were being rapidly devastated. The pine forests with their valuable tall trees were particularly harmed, especially those within a distance of 20-30 km of the rivers which offered a means of transporting their timber. Oak almost disappeared because it grew mainly on fertile soils. Hardwoods in general became scarce because of enormous potash production. Softwoods and spruce suffered tremendous insect and wind damage. Only the more remote forests still contained valuable trees.(3)

(c) According to all sources of this period, only the royal hunting forests contained mature and old timber in abundance. The forests of the royal farm estates were denuded of all but young and middle age growth. An inventory for the year 1768 of the Olava estate of about 2,000 hectares near Alytus mentions that the forests of the estate contained no structural timber at all. This forest area was located about 15 km from the Nemunas River. The peasant forests contained only young growth, mainly softwoods of sprout origin.

(d) Prof Matulionis estimates that the forest density in Lithuania in 1795 was 40-50% on about 2,000,000 hectares. The increment (about 3.0 fest meters per year per hectare) may be estimated to have been about 5-6,000,000 fest meters a year for the area included in the Lithuanian Republic (1918-1939).

6. Forest Legislation

(a) Lithuanian laws and traditions were codified in the "Statut Litovskii" in 1530.(4) A later revised version of the code was in effect until 1840 when it was superseded by Russian legislation (Svod Zakonov Rossiiskoi Imperii of 1838). Chapter XIII of the Lithuanian Code was devoted to forest property and its management, including hunting, bee keeping, and other minor uses of forest lands, and emphasized fines and punishments for violations.

(b) The chaos occasioned in the forests by the right of entry resulted in King Zygmunt II's action in 1557. His regulation "Ustav na Voloki, 1557" brought better order to royal farm and forest estates. His regulations were based on the "Huf Ordnung" of the German countryside and anticipated the three field system. The King's properties were surveyed, entry rights exchanged for land, and special regulations were established which, considering all factors, were equal to those in Western Europe. Later on, special royal inspectors visited the forests, approved the results of the forestry reform, and issued new and detailed regulations and orders to the forest masters.(5)

(c) Regulations covering the forests of the land owners and clergy were occasionally detailed and well developed, especially in the larger holdings, but there was no general code, and regulations usually lasted only during the period of the interested land owner's lifetime. The mass of this type of holdings, therefore, including the majority of the country's forests, were not covered by regulations guiding their management.

7. Forest Administration

(a) Royal Hunting Estates

(1) The best managed forests were those on the royal hunting estates (Pushchas). Wood, except for dead or fallen timber, was never taken from some of them and they were under guard. Special lanes and meadows were maintained for purposes of feeding wild life. They were always administratively connected with a royal farm estate and bore its name (e.g. Rudniki, Olkieniki, Orany, etc). Their forest areas were divided into quarters and the quarters into circuits. Their boundaries were surveyed and marked. The size of a quarter averaged 49,000 hectares, and a circuit 2,850 hectares, and the average Pushcha included 147,000 hectares.

(2) Pushchas were usually managed by a forest master, a noble in the King's special favor, who was compensated for his efforts by being allowed to use the royal farming estate. Another royal appointee, a "Hunting Inspector", supervised the affairs of the forest masters. Both the Hunting Inspector and the forest master were strictly controlled by regulations. As a result the use of the Pushchas was very restricted and they were relatively well controlled. Guard forces were made up of bond servants and free men (Osochniks). As compensation, they received 7-20 hectares of farm land belonging to the royal possessions, to be used as long as they served. They were exempt from the contributions which other peasants had to pay. The guards were supervised by mounted guards or range riders. As compensation, the latter were given for their use an area of land twice as large as that allowed the ordinary guards. In addition to these two groups, there were special hunting aids called "Streltsy" (game wardens) or shooters. They were recruited from the royal army and established on Pushchas to protect wild life and to aid in hunting. They had no right to hunt for themselves. They were compensated in the same way as the mounted guards were. All officials and guards also received structural and fuel wood for their own uses. When a guard became too old for his duties or was otherwise incapacitated, he could hand down his duties to his son. If he had no son, he had to leave the Pushcha. This was a tradition even up to 1939, although it was not covered in the law.

(3) The compensation paid to the guards was insufficient and no part of it was paid in money. As a result, the guards were unscrupulous and subject to bribery. This was especially true at the time of the Polish Partition in 1795. The demand for timber was then high because the valuable trees had been stripped from the property of the land owners and clergy. They remained only on the royal properties, and the guard system was not only inadequate to protect them but the guards themselves sometimes cut them down and sold them. The royal officials, concerned about this, began in 1764 to remove the Osochniks and the Streltzy and to replace them with a hired force of better paid free men who lived on the edges of the Pushchas. The Russian occupation brought an end to the move.(6)

(b) Forests Attached to Royal Farming Estates

The Pushchas designated to support the economies of the farm estates were in worse condition than those on the hunting estates. Most of the farm estates were rented to tenants who eagerly cut the good timber for their own profit. Most of these Pushchas were designated for conversion into farm land and for colonization by serfs. Those who cut the forests and turned them into farms were given special privileges. As a result, huge forest areas in the present counties of Marijampole, Vilkaviskis, Alytus, and Seinai disappeared very rapidly. By 1795, Pushchas on the farm estates were limited and only sufficient to produce wood for the estate itself and for the serfs bound to that land. Guard duty over these forests was performed by the bound peasants who received as compensation, examption from the usual contributions to the estate. The guards served as fire watchers and were empowered to call out the peasants as fire fighters when necessary. The guard system was inadequate to keep out poachers and to ensure proper use of grazing facilities and wood lots. As a result these tracts were in very poor condition. The guarded areas on the farm estates were smaller than those on the hunting estates. On the Daugau estate (Alytus County) in 1763, for example, one guard was responsible for 1,200 hectares of forest land.

(c) Forests Belonging to the Gentry and Clergy

These forests, in general, were managed like those of the royal farm estates except that the manager was also the owner. If the estate was rented, the forests were also included in the agreement. Violations of these forests and thefts of their timber were more common than from the royal forests. At times armed gangs invaded them (sometimes for weeks at a time) to strip them of valuable timber.(7) It was necessary, occasionally, to call on the army to end these lawless invasions. The smaller land holders were particularly troubled by these gangs. When they could afford guards, they paid them in the same way as those who served on the royal estates.

(d) Peasant Forests

The peasant forests were almost entirely stripped of their valuable timber at an early date as a result of the peasant's need for money. Following the Swedish war and the pestilence of 1710-1712, the obligatory contributions of the peasants were in many cases changed to monetary contributions. Money was scarce, there was no industry, and the only way for a peasant to earn money was to sell his timber. The removal of this valuable commodity also served to protect his property since it decreased its value and made it less attractive to someone who might otherwise seize it. After their own timber was gone and as prices continued to rise, the peasants were apt to go into even the comparatively well-guarded royal forests to steal timber.

8. Education, Research, Press, Reforestation

(a) There were no special forestry schools. Forest masters were appointed on the basis of their reputations for honesty and their ability to work. They were representatives of the gentry and possessed their own estates. The hunting masters (inspectors) were also of the noble class and in addition, had the personal favor and confidence of the royal family. They were experienced organizers of the hunt. The guard was recruited from among middle age, healthy and wealthy peasants.

(b) There was no press to print works on forestry and no research into proper forest practices. The only recorded remarks on the subject were those added by the forest masters to their reports to Warsaw.

(c) Reforestation was by natural means only but progressed well because cutting was selective. The character of the forest was not materially affected by the cutting.(8)

9. Forest Use

(a) There were no real work plans in the forests, even on the royal hunting estates. Royal forest orders of the time make no mention of the forestry conceptions of yield, increment, cutting rates, etc.(9)The forestry interest was second to the hunting interest and the chief activity on these estates was the protection of the latter.

(b) Measurement of the area of the forests was very haphazard. The width and breadth of the estates were measured in miles (7 KM = 1 German mile) and at best in Voloki (equals approximately 16 hectares).

(c) Wood was not cut on some royal hunting estates until 1795. Portions of royal farm estates were designated for agricultural purposes, and their timber was quickly stripped away. Certain Pushchas were especially set aside for wood cutting. The central portions of these forests were reserved and the most valuable timber was cut for export. These were called "merchandise Pushchas". They were bounded by natural features (roads, meadows, lakes, etc) and fairly well guarded. Sections of forest around the merchandise Pushchas were set aside for domestic use. These were called "Bors" and were very poorly managed. They were constantly stripped of their timber and converted to agricultural land, thereby eliminating the "right of entry" for the peasants. Private forests were logged selectively (according to need). Rights to cut timber were originally sold for a particular area for a particular length of time but by 1795, in most cases the cost of purchase was determined by counting stumps or measuring the individual logs. The stumps and other debris of logging were left in the forests and helped to stimulate insect growth and forest fires. It also became the practice to leave the undergrowth and young trees to help stimulate reforestation. Grazing on the cut-over areas was prohibited for the same reason.(10)

10. Forest Protection

(a) The first serious act to protect the forests was that of Zygmunt II when he issued the "Ustav na Voloki" in 1557. The gentry and clergy, seeing the good results of Zygmunt's measures, took the same steps on their own properties but with less success. In most of these cases the "right of entry" was not revoked. To avoid this obligation, in many cases they cut down their own forests. War, unrest, economic necessity, and the difficulties involved in guarding the valuable timber also stimulated them to strip their forests. The tendency toward converting forest to farmland lasted until 1888 when the Russian authorities issued an edict of "Forest Preservation".

(b) Fire was most common in the pine forests which were mainly royal possessions and were located in eastern Lithuania. Because these were comparatively well guarded and managed, fire losses were not excessive, but by 1918 there were few pine forests which had not been scarred by fire.(11) Fires were most common during war time. The peasants had an obligation to fight forest fires and to protect the forests of the estates to which they were bound. The forests used by the peasants suffered from fire because of the carelessness of the shepherds and other users.

(c) No care was taken to prevent insect damage in the forests. In 1865, the large spruce forests were blocked by dead and fallen trees killed by insects.(12) One of the most important duties of Russian forest-masters was the removal of fallen timber to keep the forests clean. This was done to protect against fire but there was no realization of the damage caused by fungi and insects.

11. Improvements

(a) Most improvements were made on the largest royal hunting estates. Most important of these was the surveying of the forests; also done by many private landowners. Following the surveys, the boundaries were kept clear and marked by sharp posts set in earthen mounds. Lanes were cut through the hunting forests and kept clear. The guard and sometimes the peasants were charged with this duty.

(b) No money was spent on roads, but the guards were charged with their maintenance. This was very primitive and the roads were always in very bad condition. Holes were filled with gravel or with branches. In swampy areas, logs were placed in layers, and covered with bundles of twigs, and then with gravel. Bridges over the worst marshy spots consisted only of two parallel logs. This is still true today in the swampy woodlands of Western Lithuania (Samogitia). Wooden bridges were built and maintained by the guards. They were constantly in need of repair and frequently dangerous to use. Some bridges of this type were still in use as late as 1939.

12. Wood in the Economy of Lithuania

(a) Significance. The significance of wood in the national economy of Lithuania and in the life of the average Lithuanian has always been enormous. In 1795, for example, each inhabitant required nearly three cubic meters of wood per year and potash production used up each year an amount equal to one fest meter per inhabitant.(13) In 1795, there were approximately two million hectares of forest in Lithuania with an annual growth increment of six million fest meters. In the area (in 1795) lived approximately one million people.(14) Their annual demand for wood equalled three million fest meters and an additional one million fest meters went into potash production. In addition, approximately 50 thousand fest meters of wood were exported and 2,500,000 fest meters were lost through waste, damage, and disease in the forests.

(b) Logging Operations. The logging season traditionally came in the autumn following harvesting and seeding. The peasants accomplished part of their obligations to the owner by forest work, but after this obligation was satisfied they were free to hire out. For this labor they were usually paid in goods such as salt, sugar, iron and steel implements, etc. They worked close to their homes and were very eager for the opportunity. Thus, labor was cheap and abundant. Supervision of the logging operations was performed by experienced representatives of the timber purchasers. These representatives usually dealt through the local forest guards for the guards could cause trouble if they were not hired. The guard would recruit the labor and take the responsibility for guarding the fallen timber and fabricated lumber.

(c) Business Operations. Large import companies in England, the Netherlands, Denmark, Germany, and other countries had contract agents in Koenigsburg, Danzig, Memel (Klaipeda), and Riga. These agents were merchants and money lenders. They obtained timber from land holders in payment of debts owed to them. Land holders, hard pressed by debts incurred in war time, were forced to sell timber at low rates and the agents made huge profits on its sale abroad. Even the royal treasury was sometimes forced to sell at low rates. The agents formed combinations and worked without competition under the laws of the Czarist state. Most transactions were effected in the seats of the agents, but sub-agents also did business in Kaunas and Vilno. After a contract was signed, representatives of the agents would go to the forest area to establish an office from which the labor was hired and the timber exploitation directed.

(d) Tools. The most important tool was the adze, locally manufactured by the village smith and used to hew boards, planks, and staves. The peasants kept them in good shape and sharp enough for a reasonably good job, but much valuable wood was lost under the adze blade. The cross-cut saw began to be used about 1795 and the pit saw at a somewhat later date. Special chisels were used to make holes through both ends of fallen logs so that they could be fastened for rafting. This practice ruined additional valuable wood. A home-made winch was also in common use.

(e) Lumber. Pine and spruce logs approximately 22-25 cm thick were cut into 10 meter lengths for use in the construction of buildings, sheds, wells, etc. Logs of larger dimension (30-35 cm) were selected for splitting and hewing into lumber. Smaller pieces were chosen for use as roofing material, fence posts, and fuel. Structural material was sold by the piece and fuel wood by the cord. Exports were composed of hewed pine logs about one fest meter in volume; round pine logs of the same size; pine piles; and oak staves and oak boards hewed to various sizes.(15) Common log sizes were:

Pine	- average 30' x 13" (round and hewed)
Oak Wainscot	- 9' plus 10" x 10" (one side rounded)
Oak and pine mast logs	- highest quality, minimum 130 cm in circumference six meters from the base, 22-30 meters long, already scarce in Lithuania in 1795 and completely exhausted by 1817.(16)

(f) Transportation

(1) Land. During the winter the peasants hired out to transport the felled timber from the forests. The logs were placed on primitive horse-drawn sleds by home-made winches. One horse could pull a sled load of approximately 1 - 1 1/2 fest meters of wood. Frozen lakes and rivers were the best avenues of travel. Trips were arranged so that the peasant could return to his home each night (10 Km in hilly country, 15-20 Km where conditions were better). Longer trips which necessitated overnight stays were better paid. Staves and potash were transported greater distances (up to 50-60 Km) and salt (needed for payment) up to 200 Km by riders.(17) The transported timber was collected beside the rivers in accumulations which were called "bindings". These collections were ordinarily the headquarters of the sub-agents and were well guarded.

(2) Water

a. The main rivers on which the wood was floated were the Nemunas; Vilija; the Sventoji (Svienta); a tributary of the Vilija; Merkys (Merechanka); Jura; Nemunelis (Niemenek); and the Daugava (Duna). The velocity of the water on these rivers was 4-4.5 Km per hour.(18) The trip from Merkine (Marech) to Klaipeda (Memel) on the Nemunas took about 11 days. The best rafting conditions were at normal water (mid-level). The rivers were usually frozen over about 15-20 December and were free of ice at the end of March. The spring flood period lasted about 14 days and there were often one or two late summer rises in the river level because of heavy rains. Nevertheless, the rafting period usually lasted from the end of March to mid-November. Some work was done on the river beds in the 18th Century but very little. Even during the 19th Century, the rapids and shallows of the Nemunas destroyed on the average every sixth barge and raft. The same was true on the Vilija and other rivers.(19) It took great skill to pilot the rafts and barges. The water wheels of mills were one formidable obstacle to rafts on the rivers. The most important river ports were Kaunas and Jurbarkas (Jurborg) on the Nemunas.

b. The timber was stored in "bindings" on the rivers and streams until the ice melted. On the smaller streams the best time for moving the timber was at the crest of the spring flood. Brought to a lake or larger river assembly point, the logs were formed into rafts with the logs already there. Work on the formation of these rafts began as early as possible in the spring. The rafts were made of 10-12 meter logs laid parallel to a width of approximately 9 meters.

Each log was fastened to cross pieces by means of skillfully twisted willow twigs drawn through the holes on each end of the log. A single raft (link) was formed of 10-12 logs. Six to nine links made a chain containing 100-150 fest meters. Single links were floated on the tributaries of the Sventoji, Daugava, Vilija, and Nemunas, and the chains on the main rivers themselves. The length of a chain was about 90 meters, the most convenient length. After the rapids on the Rumsiskes River were blown up in 1925 it became possible to run chains 3-4 times as long containing 450-600 fest meters.(20) The rafts had a secondary function of great importance. They carried not only agricultural products (flax, grain, potash) but even passengers.(21)

c. Labor. The rafts were handled by a crew (drivers) and a supervisor. The smaller chains (90 meters long) were served by a two-man crew and one supervisor. The larger rafts required up to four men and a supervisor. The drivers rode the front and rear links of the chain and steered with strong lever-like oars. Their work was especially hard while rounding bends in the river. The drivers were very skillful and experienced. They were mainly free, White Ruthenians from the small towns along the banks of the upper portions of the Nemunas and Vilija Rivers. They were relatively well paid.

(g) Wood Industry

(1) The Lithuanian population (land holders and peasants) was largely self-sufficient. It made almost everything it needed and bought extremely little except for such rare items as salt, iron implements, etc. The big farm estates had their own artisans (blacksmiths, locksmiths, carpenters, shoemakers, etc) Each estate formed a small town, the origin of most Lithuanian towns of today. In these centers, handicraft specialization progressed most rapidly. Conservatism and frequent war and unrest were serious obstacles to the development of stronger industry. The only one of any importance was the distilling industry. There were no sawmills. In 1817, Grodno Gubernia in Poland was the most industrialized area of the region. There, 536,163 persons lived on four million hectares of forest land. Thirteen saw mills served this area and population.(22) They consisted of saw blades attached to heavy, slow-moving wooden frames run by water power. They served the demands of their own farm estates only. Pit saws also appeared about this time but again satisfied only domestic requirements. A deterrent to the establishment of a saw mill industry in Lithuania was the high tariff placed on sawed wood by the Prussians.

(2) Paper manufacturers used linen rags as raw material. Demand for paper was low and most of that needed was imported. In 1815, the six paper mills of Grodno Gubernia employed only 30 laborers and produced only 463 rolls of paper. This production was sold to the governments of Vilno, Kaunas, and Minsk which had no such production.(23)

(3) Many of the forests had charcoal pits to produce fuel for smiths and some small foundries which worked with swamp iron ore containing a very low percentage of pure iron. In addition, primitive tar pits were worked using pine stumps as material for the distillation. Production was low and of poor quality, but as late as 1930, a couple of these pits were still in operation in the same manner to produce cheap tar products to grease the wooden axles of wagons.

(4) Potash production had a very ancient beginning in Lithuania. Hardwoods (elm, oak, ash, hazelnut, beech, and maple) were used in its production and huge quantities of wood were consumed. To produce one Kg of pure potash 1.5M3 of hardwood were required. The potash works were primitive installations located in the forests. They were operated by skilled laborers called "budniks". The demand for potash rose steadily and prices kept pace with demand. From 1537-1576 the customs house at Wloclaw, Poland, which controlled potash exports to Prussia, noted annual exports of 9,600,000 Kg of potash, a considerable portion of which came from Lithuania. Sometimes this portion was as much as 30% of the total because most of the forests were located in historical Lithuania (not the Lithuania of 1918-1939, which was smaller). Since the hardwoods made up only 2-3% of the forest growth, they were quickly exhausted. By 1795, customs records do not note any potash exports from Lithuania at all.(24)

(h) Commerce

(1) Lithuania as a duchy and while united with Poland, had developed an export trade in wood. Kaunas and Vilno were headquarters for this trade. The peasants supplied their masters, themselves, and the townspeople with fuel wood. They were able to do this because they had horses. As late as 1945, the peasants brought wood (either purchased or stolen) into the towns for sale. This was a principal means of livelihood after the field work was done in autumn and through the winter. Until 1945, most of the fuel wood burned in the towns was delivered by peasants and in 1939 it was still profitable to bring a raummeter (= 0.7M3 of solid wood) of fuel wood into town for sale from distances up to 70 miles (about a week of riding).(25)

(2) The wood in the forests was valued (with the exception of the larger, valuable trees and hardwoods for potash) only to the extent that labor and transportation affected it. In 1914, a laborer in a state forest received 50 kopeks (approximately US$.25) for an 8-hour day. The same man with a horse cart earned 1-1.5 rubles.(26) In 1795, compensation for the same job was even lower. In 1857 the price for a fest meter of fuel wood was about 0.5 ruble. An average pine log (8 meters long x 16 cm at the top) brought 1.5 rubles.(27) In 1795, prices were even lower. Prices for export wood and potash were set in the Code of Lithuania (1529) which was in force in the private forests until 1840. An oak suitable for one wainscot (about 2.25 fest meters) was priced at 44 zlotys (set by the Russians at 0.2 rubles to 1 zloty). A mature oak, ash, or elm suitable for potash production was worth 2.5 zlotys;

pine timber of 2 fest meters volume, 11 zlotys; and other structural timber 2-3 zlotys. In 1769-1781, a pine log with a circumference at the base of 20 palms (one palm equals 7.6 cm) or 1.5 meters cost 6-7.5 Tallors(28) at the stump in the forest. One of 18 palms circumference cost 4 tallors at the stump and 6 tallors after being hauled to Daugava. Various prices are shown below:

Tree Circumference (in Palms)	Price at Stump (in Tallors)	Price at Riga (in Tallors)
20	6	18
22	8	35
30	81	110

The best mast timber cost 20-25 Tallors at the stump but 600-1000 Tallors at Riga.(29) (The reason for this disproportionate spread in the price was because of the monopoly held by the Riga merchants.) A low duty was charged on exported timber.

(3) It is difficult to determine the quantities of timber which were exported from Lithuania because the Nemunas River was a main route for shipments to Prussia, not only from Vilno and Kaunas, but from Grodno, Minsk, and Suvalki. Some estimates are available for 1848-57. The following number of timber rafts (100-150 fest meters of wood average) passed the river port of Kaunas:

1848	-	535
1850	-	703
1852	-	1,556
1854	-	1,446
1856	-	1,036(30)

In 1857, Kaunas alone was the departure point for 345 rafts; staves sufficient to build 1,419 barrels; and 280 railroad ties. Most timber on the Nemunas came from Suvalkai. Figures for 1795, while unavailable, must have been essentially the same as above.

(4) Some manufactured paper (quantity unknown) was imported. Demand was low so imports probably were limited. Large quantities of wood from Minsk, Grodno, and Suvalkai passed through Lithuania on the Nemunas. They totalled about three times more than the Lithuanian shipments. Most of the exports of these three areas were wood. Timber rafts were reconstructed at Kaunas until 1914. The sawmill industries of Kaunas and Jonava grew up as a result of the unsuitable wood which was not made into rafts. This could be considered as imported wood. Quantities are not exactly known.

FOOTNOTES

PART II, CHAPTER I, PARAGRAPH A

(1) Matulionis, P, Visa Lietuva, 1923, "Lietuvos Miskai po didziojo Karo"

(2) Mortensen, "Litauen", 1927

(3) Handwritten Inventory of the Daugai Royal Farm Estate, 1763

(4) Lewicki, A, "Zarys Historii Polski do 1795", 1947, p 90

(5) "Pistsovaia Kniga", Grodnenskoi gubernia, 1881, 220-230

(6) Ibidem

(7) Ibidem

(8) Surozh, 1908, II

(9) "Ordinatsia Pushch B. V. K. Litovskago, 1641", 1867, pp 12, 29, 58

(10) Ibidem

(11) At an age of 50-60 years the pine tree's bark is sufficiently thick to withstand damage from ground fires - author.

(12) Korcov, "Bieloviezskaya Pushcha", 1906

(13) Author

(14) Wielhorski, Litua i Polska, 1947, p 69-106

(15) Lachnicki, J.E., "Statystyka gubernia grodzienskiey,"1817, p 72

(16) Ibidem

(17) The author's grandfather was a "saltman" who transported salt from Merecz to Minsk, a distance of more than 200 kilometers.

(18) Skerys, A, Inaugural Dissertation, Holzmarkt in Litauen, 1947, p 38

(19) Kolupaila, Prof. S., "Nemunas", 1950, p 18

(20) Skerys, Holzmarkt in Litauen, pp 37-38

(21) Afanasyev, "Kovenskaya gubernia", 1861

(22) Lachnicki, "Statystyka gubernia grodzienskiey", p 62

(23) Ibidem, p 65

(24) Hedemann, O. "Dawnepuszczy i wody", Vilno, 1934, p 51-52

(25) Vileinskas, J., Musy Girios, 1939, p 560

(26) Afanasyev, "Kov Gub", 1861, p 392

(27) Scesnulevicius, K., "Tarp Valkinyko ir Varenos", 1950

(28) A tallor was Prussian money used in Lithuania in addition to the ruble until 1850 and worth 0.23 gold rubles, "Grosse Brockhaus", 1892

(29) Hedemann, 1934, p 89-93

(30) Afanasyev, 1861, p 487, 562